

Attorney Docket: 381NP/43816CO
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: FUMIO TAJIMA ET AL.

Serial No.: NOT YET ASSIGNED

Filed: JANUARY 5, 2001

Title: PERMANENT MAGNET ELECTRIC ROTATING MACHINE AND
ELECTROMOTIVE VEHICLE USING PERMANENT MAGNET
ELECTRIC ROTATING MACHINE

PRELIMINARY AMENDMENT

Box PATENT APPLICATION

Commissioner for Patents
Washington, D.C. 20231

Sir:

Please enter the following amendments to the specification,
claims and abstract prior to the examination of the application.

IN THE SPECIFICATION:

A substitute specification and a marked-up copy thereof are
submitted herewith.

IN THE CLAIMS:

Please cancel claims 1-17 presently in the application and
substitute new claims 18-24 as follows:

--18. A permanent magnet electric rotating machine
comprising:

a stator; and

120 110 100 90 80 70 60 50 40 30 20 10
a rotor arranged at a side of an inner periphery of
said stator with a rotation air gap;

said rotor having plural permanent magnet insertion
holes arranged with a ring form, permanent magnets embedded in
said plural permanent magnet insertion holes, and auxiliary
magnetic pole portions provided between two adjacent plural
permanent magnets, wherein

a magnetic air gap is provided in both sides of a
peripheral direction of said plural permanent magnets,

thereby a change in a magnetic flux density between
said plural permanent magnets and said auxiliary magnetic pole
portions is formed smoothly and a cogging torque is restrained.

19. A permanent magnet electric rotating machine
comprising:

a stator; and

a rotor arranged at a side of an inner periphery of
said stator with a rotation air gap;

said rotor having plural permanent magnet insertion
holes arranged with a ring form, permanent magnets embedded in
said plural permanent magnet insertion holes, auxiliary magnetic
pole portions provided between two adjacent plural permanent
magnets, and magnetic pole piece portions arranged between said
plural permanent magnets and said stator, wherein

a magnetic air gap is provided between said auxiliary magnetic pole portions and said magnetic pole piece portions,

thereby a change in a magnetic flux density between said plural permanent magnets and said auxiliary magnetic pole portion is formed smoothly and a cogging torque is restrained.

20. A permanent magnet electric rotating machine according to claim 18, wherein a non-magnetic material is provided in said magnetic air gap.

21. A permanent magnet electric rotating machine according to claim 19, wherein a non-magnetic material is provided in said magnetic air gap.

22. An electromotive vehicle comprising a drive device, wherein said drive device includes the permanent magnet electric rotating machine according to claim 18.

23. An electromotive vehicle comprising a drive device, wherein said drive device includes the permanent magnet electric rotating machine according to claim 19.

24. An electromotive vehicle comprising a drive device, wherein said drive device includes the permanent magnet electric rotating machine according to claim 20.--

IN THE ABSTRACT:

Please substitute the new Abstract of the Disclosure submitted herewith on a separate page for the original Abstract presently in the application.

REMARKS

Entry of the amendments to the specification, claims and abstract before examination of the application is respectfully requested.

If there are any questions regarding this Preliminary Amendment or this application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

It is respectfully requested that, if necessary to effect a timely response, this paper be considered as a Petition for an Extension of Time sufficient to effect a timely response and shortages in other fees, be charged, or any overpayment in fees be credited, to the Account of Evenson, McKeown, Edwards &

Lenahan, P.L.L.C., Deposit Account No. 05-1323 (Docket #381NP/43816CO).

Respectfully submitted,

January 5, 2001



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JDS:pc

--ABSTRACT OF THE DISCLOSURE

A magnetic gap is provided between a permanent magnet of a rotor and an auxiliary magnetic pole portion which is arranged adjacent to the permanent magnet in a peripheral direction. A gradual change in a magnetic flux density distribution of a surface of the rotor is obtained and a cogging torque and a torque pulsation are restrained. By obtaining a reluctance torque according to the auxiliary magnetic pole, a permanent magnet electric rotating machine in which the cogging torque and the torque pulsation are restrained can be obtained and further an electromotive vehicle having the permanent magnet electric rotating machine can be provided.--